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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/606,040      06/29/00      SIGRIST

H      CSEM:060

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HM12/0829

EXAMINER

GHASHCHAEFF, E

ART UNIT

PAPER NUMBER

1656

DATE MAILED:

08/29/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application No.

09/606,040

Applicant(s)

SIGRIST ET AL.

Examiner

Fariba Ghashghaee

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1656

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 12-15 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-11 are drawn to a process for the preparation of a carbohydrate structure on a material surface by photochemically fixing one or more different compounds onto the material surface, classified in class 436, subclass 524.
- II. Claims 12-15 are drawn to a material comprising a carbohydrate structure on its surface obtainable by the aforementioned process and a biosensor for detection of carbohydrate related interactions comprising a carbohydrate structure on its surface obtainable by the process of group I, classified in class 436, subclass 518.

The inventions are distinct, each from the other because:

Inventions of group I and II are related as process of making and product made.

The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product could be made by different methods such as a simple chemical synthetic reaction.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Bob Willen on July 17, 2001 a provisional election was made with traverse to prosecute the invention of group I, claims 1-11. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-15 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention because the terms "preferably" and "most preferably" does not clearly determines the claimed invention and it needs to be clarified. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Sigrist et al. (WO 91/16425).

Sidrist et al. Discloses a process for the photochemically induced immobilization of biomolecules (protein molecules, nucleic acids, lipids, carbohydrates) and explains that the process makes it possible to immobilize biomolecules by covalent bonding in molecular layers on "inert" substances and the bonding reaction is activated by light irradiation in the absorption region of photo-activated reagents. Diazirines or aryl azides can be used as the photo-activated function. Due to the high reactivity of the photo-generated intermediate products (carbenes, nitrenes), biomolecules of different chemical composition are covalently bound by light activation of the substrate, without the need for limiting reaction conditions(See Abstract and claims 1-6).

Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Swan et al. (US Pat. No. 5,563,056).

Swan et al. Discloses a process for the preparation of a carbohydrate structure on a material surface by photochemically fixing one or more different compounds onto the material surface. Swan explains that the chemical specie may be a protein, carbohydrate, nucleic acid or lipid (See Abstract and column 2, line 41- column 3, line

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49). Swan discloses the azides compounds used in the process which has the limitation of the compounds used in the claimed invention (See column 4, line 58- column 6, line 27). Swan discloses the use of mono or disaccharide as the chemical species in the process of his invention (See column 7, lines 38-67). Swan discloses the steps used in the process of immobilization on the solid surface within his working examples which is similar to the steps used in the claimed invention (See columns 8-12, examples 1-12 and claims 1-12).

Claims 1-11 are rejected under 35 U.S.C. 102(a) as being anticipated by Leonard et al. ("ToF-SIMS and XPS Study of Photoactivatable Reagents Designed for Surface Glycoengineering", Surface and Interface Analysis, 26(11), 793-799, 1998).

Leonard teaches a process for preparation of a carbohydrate structure on a material surface by photochemically fixing one or more different compounds onto the material surface and has used glycoaryldiazirine reagent MAD-Gal which is immobilized with 350 nm light on diamond surface. Leonard has used the chemical species with the similar formula with the limitation of the claimed invention (See Abstract, and figure 1). Leonard teaches the process of this carbohydrate immobilization in detail and shows the effect of using different electron withdrawing groups in the ring (See pages 794-799 and tables 1-3).

Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyasaka et al. (US Pat. No. 5,154,808).

Miyasaka et al. Discloses a process for the preparation of a carbohydrate on a material surface by photochemically fixing one or more different compounds onto the

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material surface and by using the azide electron withdrawing groups and also enzymatically attaching one or more further carbohydrate to the modified surface obtained in the first step (See column 2, line 39-column 6, line 38 and claims 1-2). Miyasaka discloses the compounds used for the immobilization which has the limitation of the claimed invention (See column 3, line 25-column 6, line 18). Miyasaka discloses the process of immobilization by the irradiation of light in detail (See column 8, lines 44-66). Miyasaka discloses the bioactive proteins constituting the solid support of the invention include enzymes, and the enzymes include oxidases such as glucose oxidase (See column 9, lines 45-54).

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Jacobsen et al. (WO 96/31557).

Jacobsen discloses a process for immobilizing a ligand to the surface of a carbon-containing substrate comprising a photochemical step of linking of one or more photochemically reactive compounds to a carbon-containing material surface (See Abstract and page 3-5).

Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Chevolot et al. ("Synthesis and Characterization of a Photoactive Glycoaryldiazirine for Surface Glycoengineering", Bioconjugate Chem. 10, 1999, pp. 169-175).

Chevolot teaches a method for preparation of a carbohydrate on a material surface by photochemically fixing one or more compounds onto the material surface which include a radical of a mono- or oligosaccharide (See Abstract). Chevolot teaches the use of diazirine as a photoactivable function in his immobilization method (See page

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169, 2<sup>nd</sup> column-page 170, 1<sup>st</sup> column). Chevolot teaches surface photobonding and surface analysis in detail (See page 171-174). Chevolot teaches the effect of different electron withdrawing substituents of the ring in the immobilization process and shows the spectra of these samples (See page 172-174).

Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Chai-Gao et al. (US Pat. 5,858,802).

Chai-Gao discloses a method for making a device including a substrate and at least one biologically active substance bound to the surface of this substrate, which is obtained by simultaneous or sequential reaction of said substrate and of said substrate with a bifunctional coupling agent in which one of the functional groups is capable of being photoactivated and generates carbenes and is used to bind the coupling agent to the inorganic substrate and the other functional group is used to bind the coupling agent to the biologically active substrate in which said substrate is a covalent inorganic nitride (See Abstract and column 1, line 57-column8). Chai-Gao explains that the biologically active substance is used in a broad sense and includes synthetic or natural substances of low molecular weight like phospholipids, glycolipids, oligo- and monosaccharides and adds that these substances may be modified by the coupling agent before the surface is coated or may be immobilized on the surface after the photoimmobilization of said agent on the surface (See column 2, lines 21-51). Chai-Gao discloses the chemical substances and the source of reactive derivatives and the light sources used in his method of immobilization of carbohydrate on solid substrate (See column 3, line 31-column 4, line 20 and claims 1 and 9).

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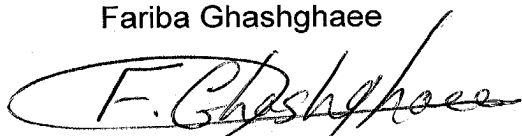
### Advisory Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fariba Ghashghaee whose telephone number is (703)305-3586. The examiner can normally be reached on 8:30 A.M.-4:30 P.M. on Mon.-Friday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703)308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3014 for regular communications and (703)305-3014 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0196.

Fariba Ghashghaee



August 27, 2001

  
KENNETH R. HORLICK  
PRIMARY EXAMINER 8/27/01  
GROUP 1600